Transmission of avocado sunblotch virus from infected mother trees to progeny seed has been known for some time as has the fact that the rate of transmission of the virus is higher in seed from recovered, symptomless carrier trees (80 to 100 percent) than from trees showing symptoms (0.5 to 5 percent). In several instances, too, young avocado seedlings of various varieties have been found to be infected with the virus when the seed-mother trees were found free of the virus. Since the infected progeny seedlings had germinated and grown under conditions which precluded the possibility of transmission by natural root graft, the most logical explanation for their infection was that the virus was transmitted by pollen and, furthermore, since the progeny seedlings exhibited symptoms as seedlings, it appeared unlikely that their infection was the result of rare mechanical transmission.

As a result of these observations, research was initiated to demonstrate pollen transmission of the virus. Early in the studies we did demonstrate that the virus was present in pollen grains. This was accomplished by implantation of pollen grains, completely free of other floral parts, from flowers of infected trees under the bark of test seedlings. The virus was successfully transmitted to seedlings utilizing this technique.

This did not, however, conclusively prove that pollen transmission occurs in nature. When attempts to effect transmission by hand pollinations proved unsuccessful because of various difficulties, especially low fruit set, honey bee pollination was utilized with a single healthy Zutano variety tree serving as the pollen recipient. The healthy Zutano field tree was selected as the source of seed for controls. This tree was left uncaged for three reasons: (1) Caging the tree without bees would result in no fruit set, (2) caging the tree alone with bees would probably result in low fruit set inasmuch as only “B” type blossoms would be present, and (3) healthy flowering trees with complementary type blossoms were not available in moveable containers.

When the blossoms on the trees were at the proper stage, a colony of honey bees (Apis mellifera L., variety Italian) was introduced into the cage in the form of a 6-frame minihive. This consisted of 4 frames of brood (with about 7,500 bees) and one frame each of capped honey and stored pollen. Water was also provided. The honey, pollen, and water were replenished as needed. When blossom production had ceased, the bees were removed, the cage was disassembled, and the virus-infected trees were moved to another location.

Verifying symptoms

During the 1977 growing season, 111 fruit set on the pollen recipient tree. Seed from these fruit were planted along with 120 seed from the healthy Zutano tree which served as controls. All were examined periodically for sunblotch disease symptoms. Two seedlings from the pollen recipient tree exhibited symptoms of sun-
Chemical growth regulation of turfgrass has been studied and practiced since the 1950s, especially on untrafficked turfs such as alongside highways, under and around fences, and in cemeteries. In closely cut, highly trafficked turfgrass swaths, however, growth reduction has not been practiced because of turf discoloration from available chemicals, and the restricted recuperative ability of turf following wear damage. The two compounds that have been available for turf growth control for years have been MH and chlorflurenol. A new chemical, Embark, diethanolamine salt of [N-(2,4-dimethyl-5-[(trifluoromethyl)-sulfonyl] amino] phenyl] acetamide became commercially available in California in 1978. Embark has caused growth inhibition and short-term discoloration; its label, therefore, specifies a single application per season, thereby minimizing hazards from unknown root growth and recuperative factors.

Methods

Several field trials to evaluate Embark were conducted from 1975 to 1977 on turf sites in southern California. The compound was applied with a CO2 pressurized sprayer at a volume of 100 gal/A to 5 x 10-foot plots, using five replications in each experiment. Treatments were made two or three days after mowing because preliminary results showed that applications immediately after mowing were less successful. Normal turfgrass maintenance, including fertilization and irrigation, was followed to insure good growth during the trial. Color, leafblade height, seedhead height and density, and dry weight were measured at various times following chemical applications.